

REMARKS

Applicant thanks the Examiner for the attention accorded the present Application in the May 9, 2003 Office Action, in which claims 1-34 were pending. In the Office Action, claims 1-34 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite; claims 1-3, 5-7, 9-11, 13, 15-18, 20-21 and 34 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kanai et al.; claims 1-4, 6-8, 17-19, 22 and 34 were rejected under 35 U.S.C. § 102(b) as being anticipated by O'Brien; claims 1-3, 6, 9-26 and 34 were rejected under 35 U.S.C. § 102(e) as being anticipated by LaGraff; claims 1-7, 9-13, 15-22 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Harrison; and claims 1-14 and 18-24 were provisionally rejected under the judicially-created doctrine of obviousness-type double patenting over claims 1-15 and 18-23 of commonly-owned co-pending US Appl. No. 09/591,531. The Examiner also noted that claims 27-33 would be allowable if rewritten or amended to overcome the 35 U.S.C. § 112, second paragraph rejection.

By the foregoing amendment, claims 1, 10, 11, 23, 27, and 29 have been amended to more clearly specify the present invention. Most specifically, independent claim 1 has been amended to clarify that the present invention is directed to methods for ***“removing at least one of: (1) an oxidized product of a substrate from a surface of the substrate, or (2) an oxidized product of a metallic coating disposed on the substrate from a surface of the metallic coating,*** comprising the step of contacting the oxidized product of the substrate or the oxidized product of the metallic coating with an aqueous composition to remove a predetermined amount of the oxidized product of the substrate or a predetermined amount of the oxidized product of the metallic coating, wherein the aqueous composition comprises an acid having the formula  $H_xAF_6$ , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.”<sup>1</sup> No new matter has been added, and the amendments are fully supported throughout the specification, as more fully described below.

Claims 1-34 are now currently pending in this Application. Based on the above amendments, Applicants respectfully submit that the rejections to claims 1-34 have been

<sup>1</sup> Applicants' spec., independent claim 1 (emphasis added).

overcome. Reconsideration of this Application, and allowance of pending claims 1-34, is respectfully requested in view of the foregoing amendments and the following remarks.

**35 USC § 112, second paragraph rejections**

Claims 1-34 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner stated that claim 1 was indefinite because it fails to positively recite a step of removing the oxide material. Claim 1 has been amended to more clearly describe the step as comprising “contacting at least one of the oxide material and the coating with an aqueous composition to remove a predetermined amount of at least one of the oxide material and the coating.” ✓

The Examiner stated that claim 11 is indefinite because it is unclear what is meant by pure water. Claim 11 has been amended to remove the word “pure.” ✓

The Examiner stated that claims 15, 16 and 25 are indefinite because it is unclear whether the percentages are expressed as weight or volume percent. Applicants respectfully submit that these claims, as pending, clearly state the percent as being mole percent, which is neither weight percent nor volume percent. This is supported by Applicants’ original application at page 9, lines 14-20. ✓

The Examiner stated that claim 23 is indefinite because it is unclear what conditions would be “sufficient to remove substantially all of the oxide material and all of the coating material. The claim fails to set forth the conditions necessary for the removal of the oxide and coating material. Claim 23 is further indefinite because it is unclear what one of ordinary skill in the art would consider as “reactive conditions”.” Claim 23 has been amended to clarify the conditions. ✓

The Examiner stated that, in claim 27, it was unclear whether the coating of step (ii) is worn or damaged. Claim 27 has been amended to remove the words “worn or damaged.”

The Examiner stated that claim 29 is indefinite because it is unclear how the oxide material directly contacts the substrate since the oxide material is present on the coating. Claim 29 has been amended to further clarify that “if an oxide material directly contacts the substrate, the oxide material directly contacting the substrate is also removed in step (i).”

Finally, the Examiner stated that claim 33 is indefinite because it is unclear what one of ordinary skill in the art would consider as “high velocity.” Applicants respectfully submit that high velocity oxy-fuel (HVOF) is a well known technique to those skilled in the art. As such, it is not indefinite. “A to Z of Terms related to the Thermal Spray Process and Surface Engineering” at <http://home.freeuk.net/englandg/glossary.htm#H> defines high velocity oxy-fuel spraying as a thermal spray process where the spray powder particles are injected into a high velocity jet formed by the combustion of oxygen and fuel, heated and accelerated to the workpiece. Additionally, “High Velocity Oxygen Fuel Thermal Spray Process” at <http://www.gordonengland.co.uk/hvof.htm> notes that “[t]he HVOF (High Velocity Oxygen Fuel) Thermal Spray Process is basically the same as the combustion powder spray process (LVOF) except that this process has been developed to produce extremely high spray velocity.” Finally, Wade Dynamics, Inc. at <http://www.wadedynamics.com/hvof.htm> notes that “HVOF, High Velocity Oxy Fuel, is a new sophisticated spraying method. ... Using this latest technology, we are now capable of accelerating alloy metal particles to the super sonic speed of *Mach 13*.”

As noted above, claims 1, 11, 23, 27 and 29 have been amended as necessary to more clearly describe Applicants’ invention. No new matter has been added, and the amendments to the claims are fully supported by Applicants’ specification. Applicants respectfully submit that the 35 U.S.C. § 112, second paragraph rejection has been overcome by the above amendments and arguments. Therefore, Applicants respectfully request that the Examiner withdraw this rejection.

### **35 U.S.C. § 102(b) rejections**

Claims 1-3, 5-7, 9-11, 13, 15-18, 20-21 and 34 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kanai et al; and claims 1-4, 6-8, 17-19, 22 and 34 stand rejected under 35 U.S.C. § 102(b) as being anticipated by O’Brien. Applicants respectfully disagree with the Examiner’s conclusion and submit that the present invention is not anticipated, nor even suggested, by Kanai et al and/or O’Brien.

As presently claimed in Applicants’ independent claim 1, Applicants’ invention comprises “[a] method for removing at least one of: (1) an oxidized product of a substrate

*from a surface of the substrate, or (2) an oxidized product of a metallic coating disposed on the substrate from a surface of the metallic coating*, comprising the step of contacting the oxidized product of the substrate or the oxidized product of the metallic coating with an aqueous composition to remove a predetermined amount of the oxidized product of the substrate or a predetermined amount of the oxidized product of the metallic coating, wherein the aqueous composition comprises an acid having the formula  $H_xAF_6$ , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.”<sup>2</sup>

In contrast, Kanai does not disclose removing an oxidized product from a substrate, nor removing an oxidized product from a coating disposed on a substrate. Kanai only discloses using a mixed solution of acetic acid, hydrogen peroxide, and hydrosilicofluoric acid ( $H_2SiF_6$ ) to completely dissolve away a coating of residual lead dioxide from a metal.<sup>3</sup> The lead dioxide that Kanai is removing is an actual coating that is intentionally coated on a base metal substrate; it is not an oxidized product of anything. Once the lead dioxide coating is consumed and/or dislodged, the coating is removed so that a new lead dioxide layer can be deposited on the substrate. Furthermore, Kanai teaches that three ingredients (not just a single ingredient as in Applicants’ invention) must be combined to remove the lead dioxide coating: acetic acid, hydrogen peroxide, and hydrosilicofluoric acid ( $H_2SiF_6$ ). Therefore, Kanai does not anticipate, nor even suggest, removing an oxidized product from a substrate, nor removing an oxidized product from a coating disposed on a substrate, as recited in independent claim 1 of Applicants’ invention.

Also in contrast, O’Brien does not disclose removing an oxidized product from a substrate, nor removing an oxidized product from a coating disposed on a substrate either. The only thing O’Brien teaches is removing a  $SiO_2$  film from a semiconductor wafer using HF, which may be buffered with  $NH_4F$ .<sup>4</sup> In fact, the only other acid even mentioned by O’Brien is  $H_2SiF_6$ ,<sup>5</sup> which is formed when the HF dissolves the  $SiO_2$  film. There is no mention anywhere in O’Brien that  $H_2SiF_6$  can be used to dissolve oxides. The  $H_2SiF_6$  is merely a by-product of the reaction of  $SiO_2$  with O’Brien’s preferred reagent, HF. Therefore, O’Brien does not anticipate, nor even suggest, removing an oxidized product

<sup>2</sup> Applicants’ spec., independent claim 1 (emphasis added).

<sup>3</sup> Kanai, Abstract.

<sup>4</sup> O’Brien, col. 1, lines 21-40.

<sup>5</sup> O’Brien, col. 2, lines 50-55.

from a substrate, nor removing an oxidized product from a coating disposed on a substrate, as recited in independent claim 1 of Applicants' invention.

Based on the above arguments, Applicants respectfully submit that independent claim 1 of the present invention is patentably distinguished from Kanai and O'Brien. As claims 2-3, 5-7, 9-11, 13, 15-18, 20-21 and 34 depend from claim 1, the discussion above applies to these claims as well. Furthermore, these claims each include separate novel features. Thus, Applicant respectfully requests allowance of pending claims 1-3, 5-7, 9-11, 13, 15-18, 20-21 and 34.

### **35 U.S.C. § 102(e) rejections**

Claims 1-3, 6, 9-26 and 34 were rejected under 35 U.S.C. § 102(e) as being anticipated by LaGraff. LaGraff has a common assignee with this application, therefore, LaGraff is not an invention "by another." Applicants have submitted a 35 U.S.C. § 1.132 affidavit in support hereof. As such, Applicants respectfully request that this rejection be withdrawn.

Withdrawn

### **35 U.S.C. § 103(a) rejections**

Claims 1-7, 9-13, 15-22 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harrison. Applicants respectfully disagree with the Examiner's conclusion and submit that the present invention is not obvious in view of, nor is it even suggested by, Harrison.

As previously discussed above, and as presently claimed in Applicants' independent claim 1, Applicants' invention comprises "*[a] method for removing at least one of: (1) an oxidized product of a substrate from a surface of the substrate, or (2) an oxidized product of a metallic coating disposed on the substrate from a surface of the metallic coating, comprising the step of contacting the oxidized product of the substrate or the oxidized product of the metallic coating with an aqueous composition to remove a predetermined amount of the oxidized product of the substrate or a predetermined amount of the oxidized product of the metallic coating, wherein the aqueous composition comprises an acid having*

the formula  $H_xAF_6$ , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.”<sup>6</sup>

In contrast, Harrison does not disclose removing an oxidized product from a substrate, nor removing an oxidized product from a coating disposed on a substrate. Harrison only discloses using an HCl solution admixed with a fluorine compound to remove scale on a metal vessel, or to dissolve limestone in an oil-bearing formation.<sup>7</sup> Harrison used HCl as an etchant, and includes a relatively small percentage of a fluorine-containing compound as an inhibitor. Harrison also includes abetyl amine as an additional inhibitor. In contrast, Applicants use  $H_xAF_6$  as the primary etchant, not as an inhibitor. Furthermore, Harrison actually teaches away from Applicants’ invention. In Table I, Harrison shows that the addition of HFS and HFTi to HCl do not change the corrosion rate of iron. In Table II, Harrison shows that the HFS and HFTi, in combination with abetyl amine, actually inhibits corrosion. In contrast, Applicants teach that the use of HFS and HFTi are actually able to corrode oxidized products. Therefore, Harrison does not disclose, nor even suggest, removing an oxidized product from a substrate, nor removing an oxidized product from a coating disposed on a substrate, as recited in independent claim 1 of Applicants’ invention. ✓

Based on the above arguments and amendments, Applicants respectfully submit that independent claim 1 of the present invention is patentably distinguished from Harrison. As claims 2-7, 9-13, 15-22 and 34 depend from claim 1, the discussion above applies to these claims as well. Furthermore, these claims each include separate novel features. Thus, Applicant respectfully requests allowance of pending claims 1-7, 9-13, 15-22 and 34.

### **Double Patenting Rejection**

Claims 1-14 and 18-24 stand provisionally rejected under the judicially-created doctrine of obviousness-type double patenting over claims 1-15 and 18-23 of commonly-owned co-pending US Appl. No. 09/591,531.

Applicants respectfully submit that the present invention is independent and distinct from the invention described and claimed in commonly-owned co-pending US Appl. No. 09/591,531. The present invention claims methods for removing ***oxidized products*** (not

<sup>6</sup> Applicants’ spec., independent claim 1.

<sup>7</sup> Harrison, col. 1, lines 30-33 and 55-58.

metallic coatings) either from a substrate or from a metallic coating on the substrate.<sup>8</sup> The invention disclosed and claimed in US Appl. No. 09/591,531 is directed to removing *metallic coatings* themselves from substrates (not oxidized products thereof).<sup>9</sup> As these two applications are directed to independent and distinct inventions, no double patenting will result, even if both applications eventually issue as patents. Therefore, Applicants respectfully request that this provisional rejection be withdrawn.

#### **Allowable Subject Matter**

The Examiner noted that claims 27-33 would be allowable if rewritten or amended to overcome the 35 U.S.C. § 112, second paragraph rejection. Applicants respectfully submit that the above arguments and amendments overcome the 35 U.S.C. § 112, second paragraph rejection. As such, Applicants respectfully request allowance of claims 27-33.

#### **CONCLUSION**

Applicant respectfully submits that the amendments to the claims, together with the arguments presented herein, successfully traverse the rejections given by the Examiner in the Office Action. For the above reasons, it is respectfully submitted that the claims now pending patentably distinguish the present invention from the cited references. Allowance of pending claims 1-34 is therefore respectfully requested.

As this response is being filed within two (2) months of the mailing date of the Office Action, Applicants believe that there is no fee due for this response. If this is incorrect, however, the Commissioner is authorized to charge any additional fees that may be due, or credit any overpayment, to **Deposit Account No. 04-1448**.

Should the Examiner have any questions, or determine that any further action is necessary to place this Application into better form for allowance, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

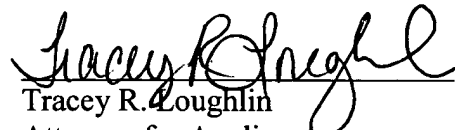
---

<sup>8</sup> Applicant's specification, independent claims 1 and 23. *See also* Applicant's specification, Detailed Description (where the "oxide material" is described in detail in the first several paragraphs).

<sup>9</sup> *See* US Appl. No. 09/591,531, paragraphs [0013] – [0014].

Respectfully submitted,

Date: 07/14/03

  
Tracey R. Loughlin  
Attorney for Applicant  
Registration No. 51,969

Tracey R. Loughlin, Esq.  
DOUGHERTY, CLEMENTS & HOFER  
1901 Roxborough Road, Suite 300  
Charlotte, NC 28211  
704-366-6642 Telephone  
704-366-9744 Facsimile





Application No.: 591,531

RD-27,817

#196  
DKing  
11-22-02

2825

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:  
Assistant Commissioner for Patents  
Washington, D.C. 20231 on NOVEMBER 12, 2002 (Date).  
Typed or printed name: KITA M. LYNCH  
Signature: Kita M. Lynch

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

L.B. Kool et al.

: Group Art Unit: 2825

Application No. 09/591,531

: Examiner: I. U. Anya

Filed: June 9, 2000

: Response to Paper No. 9

For: **Method for Removing a Coating From a Substrate,  
And Related Compositions**

AMENDMENT UNDER 37 CFR 1.111

Assistant Commissioner for Patents  
Washington, DC 20231

S I R:

In response to the Office Action dated 14 August 2002, please amend the above-identified application as follows.

IN THE CLAIMS

~~Please CANCEL claim 23 without prejudice.~~

**Please replace the indicated claims with the following corrected versions:**

A1  
1. (Amended) A method for selectively removing at least one coating from the surface of a substrate, comprising the step of contacting the coating with an aqueous composition which comprises an acid having the formula  $H_xAF_6$ , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, Zr, Al, and Ga; wherein x is 1-6; and wherein contacting said coating further comprises contacting at least one of a diffusion coating and an overlay coating.

A2  
24. (Amended) The method of claim 1, wherein the diffusion coating comprises an aluminide material.

RECEIVED  
NOV 20 2002  
TECHNOLOGY CENTER 2800

Claims  
for Double  
Patenting.

A<sup>3</sup>

26. (Amended) The method of claim 1, wherein the overlay coating comprises MCrAl(X), where M is an element selected from the group consisting of Ni, Co, Fe, and combinations thereof, and X is an element selected from the group consisting of Y, Ta, Si, Hf, Ti, Zr, B, C, and combinations thereof.

A<sup>4</sup>

34. (Amended) A method for selectively removing at least one coating material from the surface of a metallic substrate, comprising the step of contacting the coating with an aqueous composition which comprises an acid having the formula  $H_xAF_6$ , or precursors to said acid, wherein A is selected from the group consisting of Si, Ti, and Zr; wherein x is 1-3; and wherein contacting said coating further comprises contacting at least one of a diffusion coating and an overlay coating.

A<sup>5</sup>

38. (Amended) The method of claim 34, wherein the coating is selected from the group consisting of aluminides and MCrAlY materials, wherein M is an element selected from the group consisting of Ni, Co, Fe, and combinations thereof.